parameters, for instance the refractive index n or the absorption index k in the case of a transmission measurement, are varied with each calculation step until a minimum deviation is achieved between measurement and calculation, as shown in Figure 2. Resulting from this process are the thicknesses of the layers 3 through 6, with d_1 = 96.0 nm, d_2 = 20.1 nm, d_3 = 24.0, and d_4 = 130.0 nm.

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When this process described in the foregoing is applied to layer systems 2 that are or will be applied to substrates 1 with grooves or channels 7, this leads to incorrect and unacceptable results, as shown in Figure 3. It is no longer possible to obtain satisfactory consistency between calculated reflection values and the curve 32 for the measured reflection values of the curve 31.

In order to achieve satisfactory results and also to be able to measure reliably the layer thicknesses in layer systems on substrates with grooves, in accordance with the invention the light losses in perpendicular incidences on the sample are taken into account, whereby these light losses occur due to the grooves in the substrate. In accordance with the invention, preferably the inphase overlap of electromagnetic partial waves at the grooves are calculated, and thus their interference is calculated. Thus in this exemplary embodiment the width b and the depth t of the grooves 7 are also included in the variations of the parameters.